Synthesis, Liquid Crystal Characterization and Photo-Switching Studies on Fluorine Substituted Azobenzene Based Esters

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ABSTRACT

A series of fluorinated azobenzene esters have been synthesized and studied by polarized optical microscopy (POM) and UV-Vis spectrophotometry. The $-CO_2C_2H_5$ group with monofluoro-substituted azobenzene exhibited nematic and smectic phases whereas difluoro-substituted azobenzene showed only the nematic phase. The addition of the electronegative fluorine atom plays an important role in photoisomerization of the azobenzene molecules. The monofluoro-substituted azobenzene gave strong photoisomerization in solution as compared with its diflouro counterparts. In these systems, *trans*–*cis* isomerization occurred after 4 minutes and *cis*–*trans* isomerization occurred after 22 hours which is much longer than expected for fluorine-substituted azobenzene systems. The presented results might have an influence on creating optical data storage devices.

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